

Centre for Fluid and Complex Systems

Postgraduate Researchers Handbook

Academic Year 2022-2023

Introduction and welcome

As Centre Director it is my pleasure to welcome you to the Research Centre in Fluid and Complex Systems. You are joining our Research Centre at a very exciting time, as we continue to grow the size and scope of our research activities further, pushing research boundaries and delivering real-world solutions to some of the most complex external challenges. Our research benefits from an impressive, ever-growing network of commercial, academic and government partnerships here in the UK, throughout Europe and across the globe. As a researcher within the Centre you will be encouraged to access and engage with these research networks, to enhance and promote your research to the widest possible audience. We strive to achieve maximum impact from our research and our research students have won prestigious awards and their work has been published in top academic journals. I look forward to working with you to solve the next generation of complex research challenges as part of the Research Centre in Fluid and Complex Systems.

Professor Alban Potherat Centre Director, Research Centre in Fluid and Complex Systems.

Research overview

The Fluid and Complex Systems Research Centre combines unique specialist expertise and facilities from Coventry University and Glasgow-based TUV-NEL, holder of UK's national standards for flow measurement.

Fluid flow occurs in all fields of our natural and technical environment. The motion of liquids and gases plays a pivotal role in maintaining the high standards of our everyday lives: ridding us of pollutants and waste; providing most of our energy and transport; and powering much of the processes responsible for the multitude of products we rely on. Research in complex systems aims to improve our ability to predict, control and optimise these situations.

Our research is leading advances in instrumentation and modelling processes involving the flow of complex mixtures of gases and liquids across the energy, manufacturing and process industries, including oil and gas, aerospace, food, water, nuclear and automotive. For businesses selling high value commodities like petrol, a move from traditional techniques of 'forecasting' with historic data to 'now-casting' using real-time data will save millions of pounds by improving the accuracy of measurements.

By studying the behaviour of liquids and gases, we can do many things: optimise performance, for example, propellant flow in a zero-gravity environment to sustain longer periods of space exploration; identify more sustainable energy sources, such as waste biomass; and minimise negative side effects – anything from tidal erosion to the storage of unwanted carbon underground.

Key staff and contacts

The Research Centre has a strong support team who help to deliver our ground-breaking research.

Professor Eun-jin Kim, Postgraduate Research Lead

Eun-jin is the academic lead supporting all of the postgraduate researcher's within the centre. She oversees the centre's research student admissions and enrolment processes and supports students throughout their research journey.

Lorna Everall, Operations Manager

Lorna manages the overall operation of the Centre can respond to general enquiries. Having previously supported research students across the entire institution she has an excellent working knowledge of Coventry University research student processes and systems.

Phil Costen, Research Funding and Development Manager and Jonathan Godsall, Research Funding and Development Coordinator

Phil and Jonathan help identify research funding opportunities and reviews funding proposals. Both have an outstanding knowledge of the current research funding landscape.

Bally Sidhu and Humera Bhayat, Research Delivery Support Partner and Assistant (respectively)

Bally and Humera together provide project delivery support for our diverse portfolio of research projects. They ensure that research deliverables are met and projects delivered on time. They are project management experts and very knowledgeable with regards to research impact.

Ian Bates and Martin Holdsworth, Technical Support

Ian and Martin help run the experiments and support the overall operation of our laboratories.

Buildings and facilities

Our Research Centre is based in two buildings, Maudslay House and the Design Hub, both on the outskirts of the Coventry University Technology Park, in the city centre of Coventry, UK. Within Maudslay House we have a suite of laboratories with a number of fully-operational flow measurement rigs and there are always several new experimental designs in preparation at any time.

Our Research Centre brings together both expertise and facilities from Coventry University and TUV-NEL (the former government National Engineering Laboratory). TUV-NEL operate the UK national standard test facilities for flow and density measurement. As a result of our close working relationship with TUVNEL their world-leading test facilities are available to us for industrial-scale research in multiphase, wet gas, high pressure and high viscosity oil, gas and water flows. In addition we carry out research activities at CNRS Grenoble, utilizing their large-bore magnets.

Claiming student allowance and entitlements

As you will be aware, all research students have a number of entitlements from the University, including £250 for materials and equipment per year (£150 for part time), as well as £350 for conference attendance. When deciding how best to use these entitlements you should first discuss your ideas with your Director of Studies and get approval as to how you will use them.

Following this you must get approval from the Faculty. In order to do this you must contact our Research Operations Support Team (Research.MPCS@coventry.ac.uk) and provide the following information:

- Your year of study and whether you are full or part-time
- A brief explanation as to reason for the purchase
- The email chain with approval from your Director of Studies

In addition, for conference costs:

- You must be the principle author on the accepted paper
- The conference must have a good track record
- We can collate the due equipment and travel grants into one bundle, provided equipment was not claimed previously
- We will support student conference travel in all years of your research programme, provided the conference is of good standing and you are presenting your paper

If you wish for the Research Operations Support Team to book the conference for you (the conference has to be fully funded by the university) you will need to provide all details required for the booking.

In addition, for equipment costs:

- A brief justification for the purchase should be provided
- A full quote of the cost, dated within the last 3 months is required
- An explanation of what will happen to the equipment once the research is complete (i.e. plans for disposal, potential for further use or recycling)

You will receive an email confirming whether these costs have been approved or whether more information is required. Once approval has been given you can make the relevant purchases. You will then need to claim the money back from the University – please contact the Research Operations Support Team (Research.MPCS@coventry.ac.uk) with the receipts of the purchase. Please note that it can take 4-6 weeks for the funds to be transferred into your account. Please also be aware that if this is the first time that the University has paid you then you will need to be set up on our finance system and this will take additional time.

If, during your research programme, you have papers accepted at more than one conference then the Research Centre can also provide some financial support to enable you to attend. Please speak to your Director of Studies about this opportunity in the first instance.

Activities and opportunities

The breadth of research activity within the Research Centre ensures that there is a varied and dynamic research culture within the Centre. Our research students are very important to us and we put them at the heart of our research such that they gain the most benefit. In addition to strong working relationships with industrial partners research students can also benefit from some of the other activities that the Research Centre is involved in.

Flow Measurement Institute

The Research Centre was one of the founder members of the Flow Measurement Institute, FMI (www.flowmeasure.com), working alongside TUV-NEL. The FMI was formed in late 2014 as a result of extensive consultation with over 70 international organisations from industry, academia and government. The institute now has more than 500 members. The FMI provides significant opportunities for research students to share their research ideas with industry, academic and government and participate in relevant workshops, seminars as well as the annual FMI conference.

Research Seminar Series

The Research Centre runs a biweekly research seminar, where doctoral students get the opportunity to showcase their research. This is a great opportunity to learn about what others in the Centre are doing and to share ideas and build research collaborations.

Internationalisation

We attract expert speakers from across the world to Coventry University through our 'International Invited Researcher' scheme. The scheme promotes collaborative research with leading academic experts from across the world and enhances the international impact of research within the Centre. It provides a great opportunity for you to meet and work with more senior researchers and promote your research.

Doctoral Training Alliance

Our Research Centre is part of the Doctoral Training Alliance (DTA) in Energy, a postgraduate training initiative from University Alliance – Britain's universities for cities and regions (see www.unialliance.ac.uk for more details). The Doctoral Training Alliance, developed by a group of Alliance universities, builds on our research strengths and industry focused ethos. The training provided as part of the DTA will produce independent, highly-employable researchers with knowledge, expertise and skills in strategically-important research areas. The Doctoral Training Alliance is the largest multi-partner and only nationwide initiative of its kind. This Doctoral Training Alliance offers a fully funded postgraduate programme in Energy. Doctoral students gain access to excellent research, an expert support network, cohort development training and improved employment opportunities.

Fluid and Complex Systems

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